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IAP11 Rec'd PCT/PTO 08 AUG 2006<sup>1</sup>

PTO/SB/08a (07-05)

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		Application Number	New U.S. Nat'l. Phase of PCT/KR2004/002181		
		Filing Date	August 8, 2006		
		First Named Inventor	Lee et al.		
		Art Unit	Not yet assigned		
		Examiner Name	Not yet assigned		
		Attorney Docket Number	4240-148		
Sheet	1	of	3		

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code <sup>2</sup> (if known)			
	AA	US- 2005/0019857 - - A1	07-27-2005	Lee, Sang-Yup, et al.	
	AB	US- 6,274,345 - - B1	08-14-2001	Lee, Sang Yeop, et al.	
	AC	US- 5,114,674 - - A	05-19-1992	Stanbro, William D., et al.	
	AD	US- 5,807,754 - - A	09-15-1998	Zambias, Robert, et al.	
		US-			

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)				
	AE	WO - -00/61806-- A2	10-19-2000	Baer, Thomas M., et al.		
	AF	WO - -97/42507-- A1	11-13-1997	Esnouf, Michael Peter, et		
	AG	KR - -10-2004-0462832-- B1	12-10-2004	Lee, Sang Yeop, et al.		
	AH	EP - -0 818 467-- A2	01-14-1998	Miwa, Johji, et al.		
	AI	WO - -00/54046-- A2	09-14-2000	Noonan, William D., et al.		

NON PATENT LITERATURE DOCUMENTS			
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	AJ	AGTERBERG, MARJA, ET AL., Outer-membrane PhoE protein of Escherichia coli K-12 as an exposure vector: possibilities and limitations, Gene, March 1990, Page(s) 37-45, Volume 88, Number 1	
	AK	CADWELL, R.C., ET AL., Randomization of genes by PCR mutagenesis., PCR Methods Appl., August 1992, Page(s) 28-33, Volume 2, Number 1	
	AL	CHARBIT, ALAIN, ET AL., Versatility of a vector for expressing foreign polypeptides at the surface of Gram-negative bacteria, Gene, October 15, 1988, Page(s) 181-189, Volume 70, Number 1	

Examiner Signature	Date Considered	
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				<i>Application Number</i>	New U.S. Nat'l. Phase of PCT/KR2004/002181
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				<i>Art Unit</i>	Not yet assigned
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Sheet	2	of	3	<i>Attorney Docket Number</i>	4240-148

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Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	AM	CRISTALLI, GAETANO, ET AL., The Amino-Terminal Region of the Long-Chain Fatty Acid Transport Protein FadL Contains an Externally Exposed Domain..., Arch. Biochem. Biophys., May 15, 2000, Page(s) 324-333, Volume 377, Number 2	
	AN	FRANCISCO, JOSEPH A., ET AL., Production and Fluorescence-Activated Cell Sorting of Escherichia coli Expressing a Functional Antibody Fragment..., November 1993, Page(s) 10444-10448, Volume 90, Number 22	
	AO	GEORGIOU, GEORGE, ET AL., Practical applications of engineering Gram-negative bacterial cell surfaces, TIBTECH, January 1993, Page(s) 6-10, Volume 11, Number 1	
	AP	GEORGIOU, GEORGE, ET AL., Display of heterologous proteins on the surface of microorganisms: From the screening of combinatorial libraries to..., Nat. Biotechnol., January 1997, Page(s) 29-34, Volume 15, Number 1	
	AQ	KJÆRGAARD, KRISTIAN, ET AL., Sequestration of Zinc Oxide by Fimbrial Designer Chelators , Appl. Environ. Microbiol., January 2000, Page(s) 10-14, Volume 66, Number 1	
	AR	KUMAR, G.B., ET AL., Bacterial long-chain fatty acid transport. Identification of amino acid residues within the outer membrane protein FadL , J. Biol. Chem., July 25, 1993, Page(s) 15469-15476, Volume 268, Number 21	
	AS	LÄNG, HANNU, ET AL., Characterization of adhesive epitopes with the OmpS display system , Eur. J. Biochem., January 2000, Page(s) 163, Volume 267, Number 1	
	AT	LEE, JONG-SOO, ET AL., Surface-displayed viral antigens on Salmonella carrier vaccine, Nature Biotechnology, June 2000, Page(s) 645-648, Volume 18, Number 6	
	AU	LEE, SANG YUP, ET AL., Microbial cell-surface display, TIBTECH, January 2003, Page(s) 45-52, Volume 21, Number 1	
	AV	LUTZ, STEFAN, ET AL., Homology-independent protein engineering , Curr. Opin. Biotechnol., August 1, 2000, Page(s) 319-324, Volume 11, Number 4	

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

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	AW	MARTINEAU, P., ET AL., A Genetic System to Elicit and Monitor Anti-Peptide Antibodies Without Peptide Synthesis, Bio/Technology, February 1991, Page(s) 170-172, Volume 9, Number 2	
	AX	NESS, JON E., ET AL., DNA shuffling of subgenomic sequences of subtilisin, Nat. Biotechnol., September 1999, Page(s) 893-896, Volume 17, Number 9	
	AY	RICHINS, RICHARD D., ET AL., Biodegradation of organophosphorus pesticides by surface-expressed organophosphorus hydrolase, Nat. Biotechnol., October 1997, Page(s) 984-987, Volume 15, Number 10	
	AZ	SAMUELSON, PATRIK, ET AL., Display of proteins on bacteria, J. Biotechnol., June 26, 2002, Page(s) 129-154, Volume 96, Number 2	
	BA	SHAO, Z., ET AL., Random-priming in vitro recombination: an effective tool for directed evolution, Nucleic Acids Res., January 1998, Page(s) 681-683, Volume 26, Number 2	
	BB	SOUSA, CAROLINA, ET AL., Metalloidsorption by Escherichia coli Cells Displaying Yeast and Mammalian Metallothioneins Anchored to the Outer Membrane, J. Bacteriol., May 1998, Page(s) 2280-2284, Volume 180, Number 9	
	BC	STÄHL, STEFAN, ET AL., Bacterial surface display: trends and progress, TIBTECH, May 1997, Page(s) 185-192, Volume 15, Number 5	
	BD	STEMMER, WILLEM P.C., Rapid evolution of a protein in vitro by DNA shuffling, Nature, August 4, 1994, Page(s) 389-391, Volume 370, Number 6488	
	BE	ZHAO, HUIMIN, ET AL., Molecular evolution by staggered extension process (StEP) in vitro recombination, Nat. Biotechnol., March 1998, Page(s) 258-261, Volume 16, Number 3	

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